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ABSTRACT

This paper discusses the three phases of the recent and future work of the Network groups--Network 1--of the OECD/CERI International Indicators Project. Essentially, Network 1's responsibility is to develop and test "participation" indicators on enrollments, educational career paths, and school leavers at different stages of the member countries' educational systems for the ultimate purposes of improving retention in secondary and higher education, enhancing student completion of programs that fit the requisites of the high technology job market, ensuring equality of educational outcomes, and informing governments regarding the educational policy and management of vocational instruction. Specifically, Network 1 offered preliminary assessments of the policy areas where participation indicators have been or could be of assistance; reviewed the education systems and the data collections of each country; and developed indicator definitions and research methodologies for the indicators. The paper concludes that the Network's overriding interest is to develop participation indicators that are relevant to policy interests and that have sufficient reliability and depth so that they can be used, with confidence, to inform policy decisions. This common interest makes a strong statement about the social and economic pressures on governments around the world to improve their educational systems in terms of access, outcomes, and effectiveness. (JAM)

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INDICATORS ON ENROLMENT, EDUCATIONAL CAREER PATHS AND SCHOOL LEAVERS AT DIFFERENT STAGES OF THE EDUCATIONAL SYSTEM : EXISTING INSTRUMENTS, METHODOLOGICAL PROBLEMS, REASONS AND PROSPECTS FOR INTERNATIONAL COOPERATION

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Introduction

This paper will discuss the recent and future work of one of the Network groups - Network 1 - of the OECD/CERI International Indicators Project.

Network One's responsibility is to develop and test indicators on enrolments, educational career paths, and school leavers at different stages of the educational system. In other words, to develop indicators relating to participation in education. Through this paper, I will be using the words "participation in education" to describe a broader concept than that implied by just enrolment, and the indicators that Network 1 is interested in will be providing a similarly broad picture of flows and patterns of participation across educational systems. The indicator areas Network 1 is investigating include: the proportion of the population, or population groups, attending and completing school, and enrolment and retention patterns throughout different sectors, levels and streams of the education system.

Before discussing the work of Network 1, it is appropriate to look at the prior question: why have seventeen countries decided to invest time and effort into developing indicators of participation. It is impossible to accurately discern all of the social, political and intellectual forces that shaped 17 diplomatic decisions, but it is possible to infer from the comments of national delegates, and the various dossiers prepared by network members, some of the reasons for a high level of interest in participation indicators.

The first and most obvious and most significant reason is that measures of education participation are "policy relevant" for many western governments. Policies and programs, whose goals is to increase participation in education across the community in general, and by certain groups in particular, are common to nearly all OECD countries. In Australia for example, the Federal Government has been advocating increases in secondary school completion rates for a number of reasons including economic competitiveness and equality of outcomes. To this end, the Federal Minister for Employment, Education and Training has argued that Australia needs a better-educated community, and a more broadly adaptable community, to respond to the technological changes in work processes and the way work is organised. He argues that it is improved schooling - and improved outcomes of schooling - which will provide "the foundation upon which development of a more highly skilled, adaptable and productive labour force depends" (Dawkins, 1988). France has just announced a program aimed at improving participation in post compulsory education and Italy has been following a policy of increased school retention in recent years.

The broad assumptions underlying these policies is that increased participation rates will improve the life chances of individuals within society, and will also increase the social and economic resources of a nation. The political appeal of these assumptions and the need to place them in a context have made it imperative that Governments and educational leaders have access to information which enables them to compare participation across groups within their country, and with other countries of similar economic and social circumstances. Such comparisons help to inform policy directions and decisions. It is also imperative that Governments have access to information which, over time, enables them to monitor their progress towards these policy goals. In the movement towards greater accountability of public institutions, participation indicators can provide information about outcomes which is summative and descriptive.

Participation in particular aspects or dimensions of the education system is also of strong policy interest to many Governments. For example, enrolment rates in mathematics and science courses are linked with policies about technological advancement, skill formation and investment priorities. International comparisons of these rates are used to guide and legitimate the policy decisions and resource allocation priorities of Governments. In the USA, the desire to improve enrolments in maths and sciences is linked with a desire to improve international competitiveness in high technology industries. Equity issues are also informed by data about the participation of women and ethnic minorities in particular subject areas. For example, the National Data Base on the Education of Girls in Australian schools has shown lower levels of female participation in physics, chemistry and in high level mathematics courses compared to male participation rates. Concomitant with this is a pattern of high female participation in humanities based subjects, despite the subsequent limitations this often places on their future career choices (in 1985, 2/3 of female employees were concentrated in only three occupational groups). The Data Base also provides valuable general information on the curriculum patterns of male and female students. In general, male curriculum patterns are narrower and focussed on entry to a specific career. Female curriculum patterns are broader, which suggests their career plans are non-specific in the senior years of high school.

Data presented on other forms of training and education are equally revealing: for example, only 12.2% of apprenticeships are held by women, overwhelmingly within hairdressing. Given such a breakdown, questions relating to future resource allocations are obvious.

The policy relevance of participation measures is not confined to school and vocational education. In higher education participation data on mature age entrants, on the access of women to particular faculties, the geographic, social class and ethnic backgrounds of cohorts of entrants and graduates can be linked to a range of policy issues. These include financial assistance measures, selection policies and procedures, and equality of outcomes. Monitoring these sorts of indicators can reveal areas which need specific program responses. In Sweden, for example, participation indicators showed a particularly high drop-out rate among females in non-traditional courses (i.e. male dominated) in higher education. Special measures were then introduced by the Government and the National Board of Education to support females in these courses including summer technology courses for females, separate study groups for females, and in-service training for teachers to alert them to the problems of female students in these courses.

A second reason why Governments are willing to invest in the development of participation indicators is that as well as providing information about the effects or outcomes of education, participation indicators can provide information about the processes of education. While it is difficult to definitively categorize indicators in terms of the simple four-part model of resources, environment, processes and effects, the popular interpretations of participation indicators are as indicators of educational outcome. For example, apparent retention rates - one measure of participation - are often interpreted as measures of the quality of a school or school system. On a national level, apparent retention rates are often used as a proxy measure for the educational effort of a nation. The conceptual framework underlying these interpretations is that measures of participation are measures of output or outcome.

Yet participation indicators can also be thought of as process indicators. For example, grade completion rate - a measure of participation closely related to apparent retention rate, and often similarly interpreted as a measure of outcome - can be seen as a process indicator because it provides information about the way learning is structured within the system, and flows of participation within the system. It can be said to provide information about the process or processes of the system rather than the end outcome of the system. Indeed it is possible to make an argument that participation measures are quite distinct from effects because they do not make any assessment of the "value added" to students by the process of education. Instead, they are a measure of the behaviour and choices of students within the system of education.

Recognising this conceptual duality or ambiguity provides a rationale for pushing participation indicators past the measurement of outcomes. Participation indicators should make use of measures of process : student flow from grade to grade and between educational sectors, for example. Process indicators could also, perhaps, include measures of student behaviour such as course selection and truancy. These are linked to key policy issues or political concerns in some countries. The USA for example has made considerable effort to measure student absenteeism and monitor school dropouts. France has been concerned with the high levels of repetition in the school system

both for reasons of equity and efficiency. International comparisons on these dimensions provide important benchmarks, and suggest the need for closer investigation where marked differences are found. Norway, for example has extremely low school repetition rates and these are a direct result of Government policies and school practices about movement through grades of schooling.

There is a third and more practical reason for the high level of international interest in participation measures - it is that in some ways work in this area will be easier and more likely to show some immediate benefits. It is easier because there are already strong data bases in each country, holding information relevant to participation indicator areas. This is consistent with the strong worldwide policy interest in the collection and use of participation data. The sort of relevant information currently collected by most OECD countries includes rates of entry to, and retention in, various types and levels of education, and rates and levels of completion by different population groups.

The fourth reason that can be discerned in national responses is that there are a number of relatively strong methodological approaches which can be applied to derive internationally comparable information. Each of these methods have advocates who are seeking to test the efficacy and utility of competing approaches. Other countries involved are concerned to use the collaborative technical resources of this international group to find and develop a methodology which overcomes some of the known limitations of current measurement techniques.

One of the methodological approaches which will be examined is the use of "fictitious cohorts" - or probabilities - as a means of depicting student flows. This method is used in several countries, notably Canada, and has several advantages over other methods but has certain limitations as well. One limitation is its conceptual emphasis on rates of entrance to grades, rather than completion.

The use of longitudinal studies rather than cross-sectional studies is also an issue. Longitudinal studies are particularly useful in tracking student flows, but require a long term approach to data collection. Some countries already have longitudinal data that could be available for use, but others have not. Longitudinal data is used extensively in Sweden, where records are kept on every individual school student, commencing at age 15. The opportunity to systematically appraise these methods and apply them on an international basis is attractive to many countries as it represents a good and relatively inexpensive opportunity to assess a number of methodological approaches to data collection, analysis and interpretation. The outcomes of such an assessment will contribute generally to the development of better educational research techniques, and may aid countries such as Norway which are developing new monitoring and evaluation systems as part of their attempts to increase the quality of schooling.

Overall the common threads to these four sets of reasons for a high level of international interest in developing participation indicators are a high level of policy relevance of measures of

the processes and effects of education, and the opportunity to improve national data collections. They share the common assumption that more or better information will improve the quality and efficiency of education.

The Work of Network 1

First Phase - July to September 1988

The initial tasks undertaken by NW1 were to gather from member countries:

a) some preliminary assessments of the policy areas where participation indicators have been or could be of assistance; and

b) overviews of the education system and the data collections of each country.

These dossiers formed the basis of a preliminary proposal for work which was reviewed by the Scientific Advisory Group. The importance of this phase was that it ensured that the focus of the group was on the development and interpretation of indicators which were of strong policy relevance, rather than giving priority to refining statistical collections and common definitions.

Second Phase - October 1988 to January 1989

Over these four months the initial proposal for work was refined and presented to the first meeting of Network 1 in Paris in January 1989. The Network meeting endorsed the following principles:

a) interpretation of indicators should be the major focus of the group;

b) enrolment should be viewed broadly with priority given to the idea of participation;

c) the central purpose of indicators is to increase the policy relevance of information collected by member countries; and

d) indicators should be simple and useful for international comparison.

The Network reviewed sets of data, drawn from the existing OECD data base, on three potential indicator areas:

a) completion rate of compulsory schooling by a modal age;
b) graduation in upper secondary school; and
c) participation in upper secondary schools

The review revealed major deficiencies in the data held including internal inaccuracies, and differing interpretations of common definitions over time within and between nations. To overcome these sorts of constraints on the development of internationally comparable indicators the Network resolved that in the short term, data held in national collections be used to shape and calculate indicators.

The Network meeting identified four areas with potential and current policy relevance for data collection. These were commonly categorized as:

a) flows;
b) higher education;
c) longitudinal studies; and
d) qualitative issues

The interests of other Networks, particularly Networks 2 and 3, have subsequently been taken into account and Network 1 will be concentrating on flows and higher education.

In both these areas the priority tasks are:

. to identify key indicators which will describe the concepts of interest

. to develop indicator definitions

. to identify potential data sources

. to identify appropriate methodologies

. to calculate trial indicators

Participation and flows in school education is of great concern to all members of the group. It subsumes a number of issues, such as repetition, access, grade structures, completion rates in various stages and curriculum streams, drop-outs, and re-enrolments.

Approximately twenty indicators have been proposed. These will be the subject of further discussion and finalisation by the Network. Of the twenty possible indicators some examples are:

TABLE 1 - POSSIBLE INDICATORS FOR NETWORK ONE SELECTED EXAMPLES FOR PARTICIPATION AND FLOWS IN SCHOOL EDUCATION

INDICATOR	DEFINITION
1. Grade participation rates	a) The number of students in a particular grade of school expressed as a proportion of the cohort of persons who could potentially be enrolled in that grade. b) The proportion of cohort who complete/satisfy the formal requirements which allows access to the next cycle of education.
2. Attendance rate of particular grades of grades or ages	The mean number of days that students are recorded as being present, to the total school days in the year.
3. Proportion of students enrolled in selected subjects	The number of students enrolled in selected subjects expressed as a proportion of the cohort of persons who could potentially be enrolled in those subjects.
4. Re-entry rate	The number of students in Year X who return to full-time schooling after absences as a proportion of that cohort.

The first indicator in this table has two possible definitions. The first (a) is most commonly recognised and used, yet there are data problems which flow from it. In some countries, for example, the demographic data makes it difficult to define the cohort against which grade retention is being compared. This is a practical problem, but there can also be a conceptual problem in defining the cohort, particularly where the structure of a country's education system is such that there are independent sectors within it which conduct different types of educational

institutions. Where students have left "general" school and enrolled in technical/vocational courses which are not offered as part of the school system there is a conceptual problem in counting them as part of the cohort "who could be enrolled in school but are not", because their enrolment in the technical course excludes them from enrolling in school. An interpretive problem is also related to this conceptual problem. In Australia, for example, students in technical educational institutions are counted as part of the cohort who could be in a particular grade, but are not. The grade retention rate thus arrived at is often then interpreted as meaning "those participating in education". This interpretation is misleading, because it discounts those who are in technical education, and counts only those in school education.

The second possible definition for this indicator (b) has different problems. Not all countries have educational structures in which the term "completion of the formal requirements of secondary school" is appropriate or meaningful.

The second indicator in this example - attendance rates of particular grades or ages - is proposed as a solution to the problems in defining truancy and absenteeism. The comparability of attendance rate data may be affected by cross-national differences in lengths of the school year, differences in school curricula and accuracy and frequency of record taking.

The third indicator example derives from policy interests about enrolments in subjects or courses that are considered strategic to the human resources and economic development of a country. The problematic issue in the definition of this indicator example is defining the cohort of persons who could potentially be enrolled in a subject. This is an issue where there are a number of curriculum choices. The comparability of the indicator across school systems with mandated and elective curricula depends upon a solution to this problem. The limitations of this indicator are that the data will not reveal time spent on the subjects, nor what is actually taught in the subjects.

The last indicator example - re-entry rates - is one of the more difficult conceptual and technical issues in flows of enrolment patterns in education. How shall "return to full-time schooling" be defined, and data collected? Would re-enrolment simply be an af enrolment patterns in education. How shall "return to full-time schooling" be defined, and data collected?statistic? What "period of absence" would be an appropriate time after which data should be collected? How will students who have repeated a year or years of schooling be distinguished from those who are re-entering education if individual data bases are not an available methodology?

These issues illustrate some of the challenges faced by the Network in developing useful and comparable indicators.

The second area - higher education - reflects the belief that entrance rates to, and success within higher education are somewhat dependent on outcomes of the school system. Indicators of higher education enrolment are seen as important planning tools for issues of access and provision, and they need to take account of issues such as delayed entrance and mature-aged

entrance versus direct flow from school, provision for foreign students, and provision of places relative to the graduating cohort and age cohorts.

This focus on higher education is tied to the particular interest expressed by European members of the Network, where a marked increase in the number of students wishing to take up higher education studies, and an expansion of the labour market opportunities for highly qualified graduates has been a recent significant feature within their economies.

A paper outlining a proposed methodology for data collection has been prepared by the Swedish authorities who have a well-established methodology for extracting data from longitudinal surveys. This methodology will be a starting point. It allows countries to collect and present information in a number of formats such as the "annual rate". The "annual rate" is a calculation methodology which allows the annual enrolment rate of new students in higher education compared to the total population to be shown, but which is independent of the size of the population. This means that "annual rates" can be compared over time and across groups of different sizes (e.g. across countries or states). To arrive at an annual rate figure which is comparable over time and across population sizes, student numbers must be divided into one-year age groups, and total population age-group figures must be available. The concept behind the methodology is that of inverse weightings : a person belonging to a small sized age group "weighs" more in the calculations than a person belonging to a larger sized age group. The calculations are made by dividing the student populations of each age group by the total population of their age group, and summing the figures. For example, where student data shows an age range from 19-27 years as per the following distribution:-

TABLE 2 SAMPLE "ANNUAL RATE" CALCULATION DATA

Age	No. of Students	Total age population number
19	3254	65433
20	4367	68551
21	3189	68329
22	2876	67287
23	1612	67638
24	1321	66749
25	1105	66308
26	798	64165
27	467	62994

The calculation would be:

$$\text{Annual Rate} = \frac{3254}{65433} + \frac{4367}{68551} + \frac{3189}{68329} + \frac{2876}{67287} + \frac{1612}{67638} + \frac{1321}{66749} + \frac{1105}{66308} + \frac{798}{64165} + \frac{467}{62994}$$

$$\text{Annual Rate} = 0.050 + 0.064 + 0.047 + 0.043 + 0.024 + 0.020 + 0.017 + 0.012 + 0.007 = 0.284$$

The West German representatives for Network 1 have also put forward a paper on higher education indicators. They identified six issues which were of "particular political importance" and thus worthy of further investigation. The six areas can be categorized into three broad types of indicators:-

- structural indicators - number, age and structure of new entrants and graduates from universities, or comparable institutions. Over time, these would show changes in such populations (e.g. by sex, field of study, age).
- transition indicators - proportion of the graduating school cohort entering higher education.
- process indicators such as dropout rates and duration of studies, subject related indicators, and indicators of distribution by field of study.

In both areas flows - flows and higher education - the emphasis is on developing sets of indicators that illuminate a key concept and that have high interpretive value. This contrasts with earlier approaches to indicator development - particularly work in the social indicators context - which placed emphasis on single indicators, and their statistical properties. The assumption is that using sets of indicators will maximise the quality and depth of information provided. This is consistent with the intended policy uses of indicators.

Third Phase - February to September 1989

The detailed work of phase 3 depends on the endorsement of a detailed work plan by the Scientific Advisory Group in April 1989. For Network 1 the proposals can be simply described as the definition, calculation and interpretation of indicators in the two areas of flows and higher education. This will be followed by a critical assessment of the utility and potential of indicator systems at the local, national and international levels.

This critical assessment will be aided by Network members examining the strengths and weaknesses of the differing methodological approaches. It will also examine the links between participation and the organizing scheme - the four part model adopted for the project.

Conclusion

It is clear that the overriding interest of Network members is to develop participation indicators which are relevant to policy interests, and which have sufficient reliability and depth so that they can be used, with confidence, to inform policy decisions. This common interest makes a strong statement about the social and economic pressures on Governments across the world to improve their educational systems in terms of access, outcomes and effectiveness.

There are many challenges for Network 1 to overcome before arriving at sets of indicators which fulfil the objectives of member countries. With so many different educational systems and structures to take account of, the technical challenges are as great as the challenges of constructing indicator sets with a high degree of political interpretive utility. Yet the diversity of the Network is also its strength. The combined resources and co-operative approach of the project will enable a thorough and creative exploration of the conceptual and technical issues. The end result will reflect the collaborative strengths of this international project.

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